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THE HESSIAN FLY

How To Control It



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How To Control It

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The Hessian fly² is the most destructive insect enemy of wheat in the United States. Local outbreaks occur nearly every year, and widespread damage can be expected at irregular intervals, sometimes as often as every 5 or 6 years. Damage estimated at \$100 million in a single year has been caused by this pest.

Although the Hessian fly is injurious chiefly to wheat, at times it causes some damage to barley and rye. It does not attack oats. It has been found in grasses, but it does not infest them heavily.

This insect was given its common name long ago by Americans because of its damage on Long Island, N.Y., in 1779, in the vicinity of Lord Howe's encampment of 3 years be-

fore. It was believed that the Hessians in his army had brought the pest from Europe in the straw used for their bedding.

DISTRIBUTION

The map (fig. 1) shows the major distribution of the Hessian fly in the United States. It is most destructive where it occurs east of the Rocky Mountains.

In 1962 heavy losses occurred in Kansas and Nebraska where susceptible wheat varieties were grown. Heavy losses also occurred in some areas of Indiana in 1963.

DAMAGE

Maggots of the Hessian fly extract juices from stems of wheat and other grains. Stems infested in fall usually die during winter. Stems infested in spring may die, but they usually break over (lodge) shortly

¹ This publication supersedes Farmers' Bulletin 1627, "The Hessian Fly," by W. B. Cartwright (retired) and E. T. Jones (retired), Entomology Research Division.

² *Phytophaga destructor*.

before harvest when wheat heads are heavy with grain.

Infested young plants are shown in figure 2. Leaves of infested stems are more erect, usually shorter, broader, and darker than leaves of uninfested stems.

DEVELOPMENT

The Hessian fly has four stages in its life cycle: Egg, larva (maggot), pupa, and adult (fly).

The eggs, which flies deposit on leaves, are red. They are about one-fiftieth inch long; slender and almost cylindrical, with bluntly rounded ends (fig. 3). Eggs hatch into maggots in 3 to 7 days.

Immediately after hatching, maggots work their way down the leaves. Maggots descending on leaves that come from the crown of a plant feed on stems at or near the crown. Maggots descending on leaves that come from joints along the stem feed at or above the joints.

The newly hatched maggot is red-

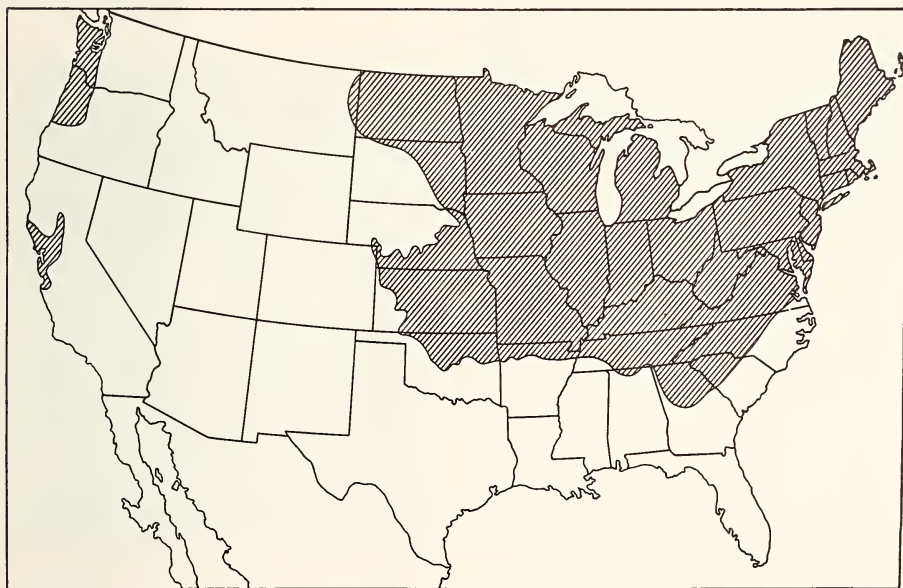
dish but changes to white in 4 or 5 days.

When the maggot becomes full grown (25 to 30 days), it is smooth,



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Figure 2.—Young wheat plants infested with larvae and flaxseeds of the Hessian fly.



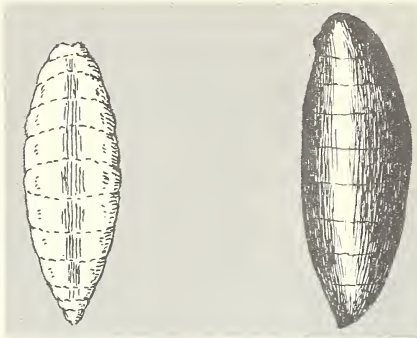
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Figure 1.—Major distribution of the Hessian fly in the United States.



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Figure 3.—Eggs of the Hessian fly. Much enlarged.



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Figure 4.—Larva (left) and flaxseed of the Hessian fly. Enlarged.

glistening, and white. It has a translucent greenish stripe down the middle of its back, through which contents of the stomach may be seen (fig. 4). The outer skin of the maggot then hardens and turns brown, forming a puparium, or protective case, which resembles and is often called a flaxseed (fig. 4).

The pupal stage (fig. 5) is passed in the flaxseed. Flaxseeds devel-

oped from eggs laid in spring spend the summer in wheat stubble and produce a second generation of flies, which emerge in late summer or early fall. Second-generation flies deposit eggs on volunteer wheat or early-sown winter wheat. Flaxseeds that develop from eggs laid on volunteer or winter wheats overwinter and produce flies in spring.

Seasonal development of the Hessian fly is shown in figure 6.

The adult (or fly) is tiny and resembles a mosquito or gnat (figs. 7 and 8). On warm days in the egg-laying season, flies may be seen flying about and laying eggs on wheat leaves. On cool days, or in early morning when there is a heavy dew, the flies are down among the leaves or on the ground. The flies live 2 to 3 days after they emerge, and the duration of the emergence period is 1 to 2 weeks.

CONTROL MEASURES

After Hessian flies infest a wheat-field, it is too late to apply control



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Figure 5.—Hessian fly pupa, removed from the flaxseed. Enlarged.

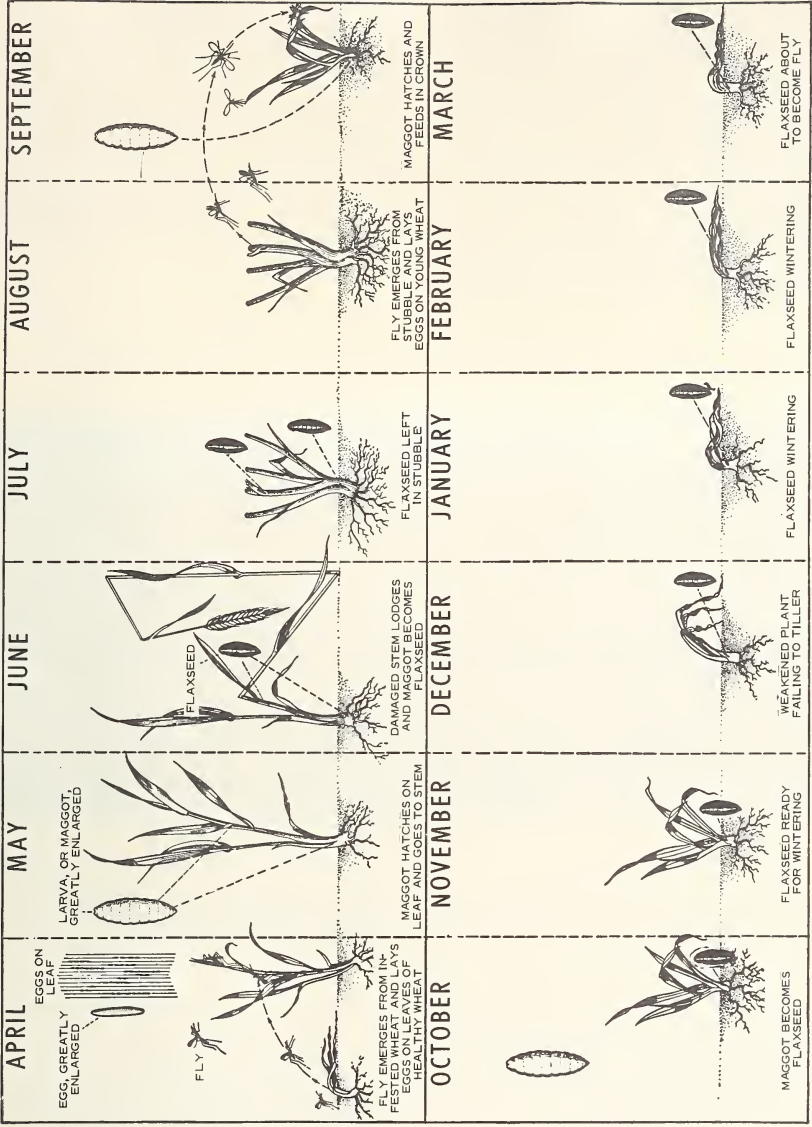
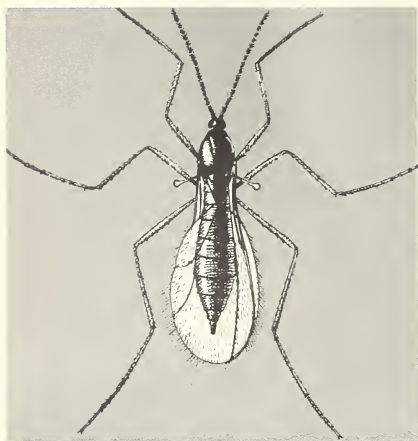


Figure 6.—Seasonal development of the Hessian fly.



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Figure 7.—Hessian fly female. Enlarged.



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Figure 8.—Hessian fly male. Enlarged.



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Figure 9.—Standing rows of young wheat are resistant to the Hessian fly; other rows are susceptible. (Courtesy of Purdue University Agricultural Experiment Station.)

measures. Infestations can be prevented, however, by following recommended practices, especially by planting wheat varieties that are resistant to the Hessian fly. Such practices are of greatest benefit when used throughout an area.

Resistant Varieties of Wheat

The use of wheat varieties that are resistant to the Hessian fly is

the most effective way to control this pest.

Maggots die within 3 days on resistant varieties and do not seriously injure the wheat (fig. 9).

Poso 42 and Big Club 43 are resistant soft white spring varieties adapted to the western wheat region, particularly California.

Russell and Lathrop are resistant hard red spring varieties, chiefly adapted to Wisconsin.



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Figure 10.—Map showing approximate dates for planting wheat to avoid Hessian fly damage.

Pawnee, Ponca, Omaha, Warrior, and Ottawa are resistant hard red winter varieties, particularly adapted to Kansas and Nebraska.

Dual, Todd, Monon, Redcoat, Ace, Georgia 1123, Reed, and Knox 62 are resistant soft red winter varieties, particularly adapted to the eastern part of the soft wheat region.

Because the Hessian fly has not been a major problem in the durum wheat areas of North Dakota, Minnesota, and Montana, no resistant durum varieties have been developed for these States.

Safe Seeding Dates

One of the most practical and effective ways of controlling Hessian flies on wheat planted in fall is

to delay seeding until most of the fall brood of flies has disappeared.

Approximate dates for safe seeding are shown in figure 10. In some States, county agricultural agents or workers in State agricultural experiment stations advise farmers of the safe seeding dates for their localities.

Crop Rotation

If possible, wheat should not be grown on the same land 2 years in succession. Continuous planting of this crop increases infestation not only by the Hessian fly but also by other insects such as the jointworm, the strawworm, and wheat stem sawflies. An approved rotation of crops should be practiced.

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- ✓ Are ladders and steps in good repair?
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